

REMARKS

Claim 20 has been rejected under 35 U.S.C. §112, as containing subject matter not described in the specification. Applicant respectfully submits that Claim 20 is fully supported by the specification, for the following reasons.

Claim 20 refers to the embodiments of Figures 8A, 8B, 9A, and 9B, and the claimed features are shown in Figures 8B and 9B. The "port diameter" of the fluid handling component is the diameter indicated on the right-hand side of the drawings (using the term "component"), and this diameter is generally equal to the diameter of the smaller diameter portion of the central bore of the sealing plate, this smaller diameter portion being designated as item 49 in Figure 8B.

The feature recited in Claim 20 does not contradict the description on page 11, line 10, quoted by the Examiner. The quoted description compares the "component" diameter indicated on the right-hand side of Figure 8B with the diameter of the port, shown at the far left-hand side of Figure 8B. Clearly, the "component" diameter on the right-hand side is smaller than the "port" diameter at the left-hand side. Claim 20 does not refer to this feature, but instead refers to the relationship described in the previous paragraph.

For purposes of clarity, Applicant has amended Claim 20 to use the term "component diameter" instead of "port diameter". This amendment is not intended to change the scope of the claim, but is made to avoid a potential ambiguity.

Applicant therefore believes that Claim 20, as amended, is fully consistent with the specification and drawings, and that it fulfills the requirements of Section 112.

The Examiner has held that Claims 5, 6, 11, and 12 define patentable subject matter. New Claims 23-26 correspond, respectively, to Claims 5, 6, 11, and 12, and are therefore believed allowable. No discussion of the references is believed necessary with regard to these claims.

The Examiner has rejected the remaining claims as unpatentable over various references. Claims 7-12 have been cancelled, without prejudice. All of the other pending claims are believed allowable for the reasons given below.

1. Claims 1-6

These claims pertain to the embodiment of Figures 2A and 2B, and also 5A and 5B. The Examiner has rejected Claim 1 as anticipated by either Smith or Breaker.

The present invention provides a one-piece plate which defines a fluid seal between two port faces. The seal "plate" of Smith is formed of multiple pieces. Elements 22 and 31 of Smith are separate rings, not sections of the same unitary plate.

The opening in the plate, recited in Claim 1, and shown in Figures 2A and 5A, is an interior opening. Smith does not show or suggest a seal which is disposed within the boundary of an interior opening formed in a unitary plate.

Claim 1 has been amended to recite that the plate is formed as one piece, and that the opening is an interior opening in the plate. These features are neither shown nor suggested by Smith. Applicant therefore submits that Claim 1 defines patentably over Smith.

The patent to Breaker provides a seal 14 that includes several distinct pieces, namely seal jacket element 26, spring element 28, and spacer element 30, as described at column 7, lines 35-37. In the present invention, the seal is formed of only one piece, such as an O-ring.

Furthermore, in Breaker, to the extent that one identifies element 30 as the "seal", as the Examiner has done, it is clear that the "support ring" 26 has an outside diameter which exceeds the outside diameter of the "seal". In the present invention, the support ring has an outside diameter which is greater than the inside diameter of the seal, but less than the outside diameter of the seal.

Claim 1 has been amended to emphasize the above features. The structure recited in Claim 1 is simpler and therefore easier to manufacture than that of Breaker. Applicant submits that Breaker neither teaches nor suggests what is now recited in Claim 1, and that Claim 1 is allowable over Breaker.

Claims 2-6 depend, directly or indirectly, from Claim 1, and are therefore also believed allowable.

2. Claims 13-15

These claims pertain to the embodiment of Figures 6A and 6B. The Examiner has rejected these claims over Erickson.

Erickson shows a pressure relief device having a diaphragm 14 which is concave in the direction facing the fluid flow. Also, the diaphragm is intended to fail at a particular pressure level, so as to provide the desired pressure relief. In the present invention, the domed portion of the blanking plate is convex in the direction facing the fluid flow.

Moreover, the domed portion is not intended to fail, but is intended to remain intact indefinitely.

Applicant has amended Claim 13 to recite that the fluid flow conduit is closed off by a blanking plate, and that the domed portion of the blanking plate is non-rupturable and non-perforated. The claim also recites that the domed portion is convex in a direction opposite the direction of fluid flow. All of these features are not shown or suggested by Erickson, and Applicant therefore submits that Claim 13 defines patentably over that reference. For the same reasons, Claims 14 and 15 are also believed allowable.

3. Claims 16-18

These claims pertain to the embodiment of Figures 7A and 7B. As described in the specification, on page 3, lines 16-23, this embodiment comprises an orifice plate for providing a controlled flow of fluid from one fluid component to another. The dome of the orifice plate is convex in the direction of the component from which the fluid flows, thereby providing the controlled flow, while withstanding high pressure from that component.

The patent to Malcolm, applied to Claims 16-18, does not teach or suggest the features mentioned above. Not only does Malcolm show a domed portion which is concave in the direction from which the fluid comes, but Malcolm also teaches discharging the fluid to an outside environment. The latter statement is true because Malcolm deals with irrigation equipment which delivers water from a conduit to the outside. The present invention, by contrast, deals with a hydraulic system in which it is necessary to move hydraulic fluid from one fluid component to another. Discharge of

hydraulic fluid to the outside is an environmental hazard, and is certainly not desirable.

Applicant has amended Claim 16 to recite a fluid handling system comprising two fluid components and an orifice plate for providing a controlled flow of fluid from one component to the other. Claim 16 also recites that the domed portion is convex in the direction of the component from which fluid flows.

For the reasons given above, Applicant submits that Claim 16 defines a patentable invention over Malcolm. Claims 17 and 18 depend from Claim 16, and are therefore also believed allowable.

4. Claims 19-22

These claims pertain to the embodiments of Figures 8A and 8B, and 9A and 9B. Claim 19 has been rejected over both Klak and Kaetscher.

With regard to Klak, the Examiner has cited plate 5 and a central bore having a "larger diameter portion" 99. Clearly, the "bore" 99 has no relationship to the elements of the present invention. In particular, the central bore of the present invention transitions smoothly from a larger diameter portion to a smaller diameter portion. There is no such smooth transition in the components of Klak cited by the Examiner. Also, the "larger diameter" portion 99 of Klak does not come into direct contact with the flow of fluid. In the present invention, substantially all of the central bore comprises a flow path for fluid.

Applicant has amended Claim 19 to recite the smooth transition, and to recite the fact that substantially all of the central bore comprises a flow path for fluid. These features are not shown or suggested by Klak.

The patent to Kaetscher has no relevance whatever to the present invention. Kaetscher shows a device for sealing a pipe as it discharges into a vessel. The seal shown in Kaetscher is larger than the outside diameter of the pipe. Kaetscher does not show a sealing plate which comprises an interface between a fluid port and a fluid handling component. Moreover, the "central bore" identified by the Examiner does not define a flow path for fluid, as is specifically recited in Claim 19. Applicant therefore submits that Claim 19 defines a patentable invention over Kaetscher.

Claims 20-22 depend from Claim 19, and are therefore also believed allowable.

Applicant has also considered the references cited by the Examiner but not applied to the claims. None of these references is believed pertinent to the patentability of the pending claims.

Version of Claims with Markings to Show Changes Made

1. (Amended) In a one-piece plate for providing a fluid seal between two port faces, the plate including an interior opening having a boundary and [an] a one-piece annular seal disposed within the boundary of the opening,

the improvement comprising a support ring disposed within the annular seal[.]

wherein the support ring has an outside diameter which is greater than an inside diameter of the seal and less than an outside diameter of the seal.

~~Please cancel Claims 7-12, without prejudice.~~

13. (Amended) In a fluid flow conduit which is closed off by a blanking plate, the [blanking plate comprising means for blocking fluid flow in a conduit,] conduit defining a direction for fluid flow therein,

the improvement wherein the blanking plate includes a non-rupturable and non-perforated domed portion, the domed portion defining a surface which is convex in a direction [of the conduit to be blocked.] opposite the direction of fluid flow.

16. (Amended) In a fluid handling system comprising first and second fluid components and an orifice plate for providing a controlled flow of fluid from the first component to the second component, the orifice plate including means for attachment of the orifice plate to one of said [a] fluid [handling device,] components,

the improvement wherein the orifice plate includes a domed portion, the domed portion defining a surface which is convex in a direction of the [conduit to be blocked] first component, and wherein the domed portion includes an orifice.

19. (Amended) In a sealing plate, the sealing plate comprising an interface between a fluid port and a fluid handling component,

the improvement wherein the sealing plate defines a central bore, and wherein the central bore transitions smoothly from a larger diameter portion to a smaller diameter portion, wherein substantially all of the central bore comprises a flow path for fluid, and wherein the sealing plate comprises a structural support for the fluid handling component.

20. (Amended) The improvement of Claim 19, wherein the fluid handling component has a [port] component diameter, and wherein the diameter of the smaller diameter portion of the central bore of the sealing plate generally equals the [port] component diameter.

23. (New) In a plate for providing a fluid seal between two port faces, the plate including an opening having a boundary and an annular seal disposed within the boundary of the opening,

the improvement comprising a support ring disposed within the annular seal, wherein the support ring includes at least one orifice which provides a fluid connection between said opening and said annular seal.

24. (New) In a plate for providing a fluid seal between two port faces, the plate including an opening having a boundary and an annular seal disposed within the boundary of the opening,

the improvement comprising a support ring disposed within the annular seal,

wherein the support ring has an outer boundary which faces an inner border of the annular seal, and wherein the support ring is chamfered on said outer boundary,

wherein the support ring includes at least one orifice which provides a fluid connection between said opening and said annular seal.

25. (New) A plate for providing a fluid seal between two port faces, comprising:

- a) an opening formed in the plate, the opening having a boundary,
- b) an annular seal disposed within the boundary of the opening, and
- c) a support ring disposed within the annular seal,

wherein the support ring includes at least one orifice which provides a fluid connection between said opening and said annular seal.

26. (New) A plate for providing a fluid seal between two port faces, comprising:

- a) an opening formed in the plate, the opening having a boundary,
- b) an annular seal disposed within the boundary of the opening, and
- c) a support ring disposed within the annular seal,

wherein the support ring has an outer boundary which faces an inner border of the annular seal, and wherein the support ring is chamfered on said outer boundary,

wherein the support ring has two chamfers, both chamfers making an angle of about 45° with an axis of the support ring, and

wherein the support ring includes at least one orifice which provides a fluid connection between said opening and said annular seal.